What is claimed is:

1. An electrochemical method for forming a ferrate salt, comprising:

providing an aqueous hydroxide solution in fluid communication between a sacrificial iron-containing anode and a cathode; and

applying an electrical potential between the anode and the cathode to produce the ferrate salt.

2. The method of claim 1, wherein the aqueous hydroxide solution includes a hydroxide selected from sodium hydroxide, potassium hydroxide, lithium hydroxide, cesium hydroxide, barium hydroxides, and combinations thereof.

3. The method of claim 1, wherein the aqueous hydroxide solution comprises one or more alkali earth metal hydroxides.

4. The method of claim 1, wherein the aqueous hydroxide solution comprises one or more alkaline earth metal hydroxides.

5. The method of claim 1, wherein the aqueous hydroxide solution comprises an alkaline earth metal hydroxide and an alkali earth metal hydroxide.

6. The method of claim 1, wherein the aqueous hydroxide solution has a hydroxide concentration between about 1 molar and about 30 molar.

7. The method of claim 1, wherein the aqueous hydroxide solution has a hydroxide concentration of between about 5 molar and 20 molar.

8. The method of claim 1, wherein the aqueous hydroxide solution has a hydroxide concentration of between about 10 molar and about 20 molar.

9. The method of claim 1, wherein the aqueous hydroxide solution comprises sodium hydroxide and potassium hydroxide.

10. The method of claim 9, wherein the sodium hydroxide and the potassium hydroxide are provided at about a one-to-one molar ratio.

11. The method of claim 9, wherein the aqueous hydroxide solution has a molar ratio of potassium hydroxide to sodium hydroxide between about 1 and about 3.

12. The method of claim 9, wherein the aqueous hydroxide solution has a molar ratio of potassium hydroxide to sodium hydroxide up to about 5.

13. The method of claim 9, wherein the aqueous hydroxide solution comprises between about 5 molar and about 15 molar NaOH and between about 5 molar and about 15 molar KOH.

14. The method of claim 1, further comprising:

providing the aqueous hydroxide solution at a temperature between about 10°C and about 80°C.

15. The method of claim 1, further comprising:

providing the aqueous hydroxide solution at a temperature between about 30°C and 40°C.

16. The method of claim 1, further comprising:

providing the aqueous hydroxide solution to the anode and the cathode in a manner selected from batch, continuous, semi-batch, and combinations thereof.

17. The method of claim 1, wherein the anode has an iron content of between 90% and 100%.

18. The method of claim 1, wherein the anode has an iron content greater than about 99%.

19. The method of claim 1, wherein the anode is selected from iron, cast iron, malleable iron, ductile iron, carbon steel, stainless steel and combinations thereof

20. The method of claim 1, wherein the anode has a configuration selected from expanded metal mesh, wire mesh, woven metal cloth, flat plate, rod and combinations thereof.

21. The method of claim 1, wherein the cathode is selected from iron, iron alloys, nickel, nickel alloys, and carbon.

22. The method of claim 1, wherein the cathode is selected from iron, cast irons, malleable iron, ductile iron, carbon steels, stainless steels and combinations thereof.

23. The method of claim 1, wherein the cathode is selected from nickel, nickel-molybdenum alloys, nickel-vanadium alloys and combinations thereof.

24. The method of claim 1, wherein the cathode has a configuration selected from expanded metal mesh, wire mesh, woven metal cloth, flat plate, rod and combinations thereof.

25. The method of claim 1, wherein the anode has a shape selected from arcuate or cylindrical, and wherein the cathode is positioned along an axis of the anode.

26. The method of claim 1, wherein the electrical potential induces an anode current density of between about 1 mA/cm^2 and 100 mA/cm^2.

27. The method of claim 1, wherein the electrical potential induces an anode current density of between about 20 mA/cm^2 and 40 mA/cm^2.

28. The method of claim 1, wherein the electrical potential induces an anode current density of between about 1 mA/cm^2 and 50 mA/cm^2.

29. The method of claim 1, wherein the electrical potential induces a current type selected from direct current, sinusoidal current, or a combination of sinusoidal current superimposed on a direct current carrier.

30. An electrochemical method for forming a ferrate salt, comprising:

providing an aqueous hydroxide solution in fluid communication between an anode and a cathode;

providing ferric ions in the aqueous hydroxide solution, wherein the ferric ions are provided by a source selected from ferric salt, iron-containing metallic particles, and combinations thereof; and

applying an electrical potential between the anode and the cathode to convert the ferric ions to ferrate salt.

31. The method of claim 30, wherein the cathode is made of material selected from iron, nickel, carbon, and alloys or combinations thereof.

32. The method of claim 30, wherein the cathode is made of material selected from iron, cast irons, malleable iron, ductile iron, carbon steels, stainless steels and combinations thereof.

33. The method of claim 30, wherein the anode is made of material selected from iron, nickel, carbon, and alloys or combinations thereof.

34. The method of claim 30, wherein the anode is made of material selected from iron, cast irons, malleable iron, ductile iron, carbon steels, stainless steels and combinations thereof.

35. The method of claim 30, wherein the electrical potential induces a current selected from direct current, alternating current, and a combination thereof.

36. The method of claim 30, wherein the electrical potential induces a sinusoidal current superimposed on a direct current carrier.

37. The method of claim 30, wherein the aqueous hydroxide solution comprises one or more hydroxides selected from sodium hydroxide, potassium hydroxide, lithium hydroxide, cesium hydroxide, barium hydroxides, and combinations thereof.

38. The method of claim 30, wherein the aqueous hydroxide solution comprises two or more hydroxides selected from sodium hydroxide, potassium hydroxide, lithium hydroxide, cesium hydroxide, barium hydroxides, and combinations thereof.

39. The method of claim 30, wherein the aqueous hydroxide solution comprises sodium hydroxide and potassium hydroxide.

40. The method of claim 30, further comprising:

providing the aqueous hydroxide solution to the cell in a manner selected from batch, continuous, semi-batch, and combinations thereof.

41. A ferrate salt produced in accordance with the method of claim 1.

42. A ferrate salt produced in accordance with the method of claim 30.